

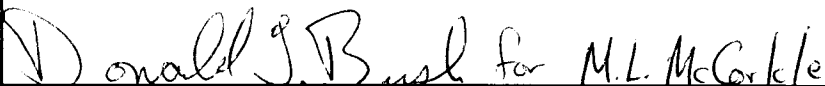
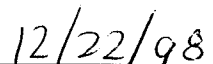


**CRITERION 601
CRANES, HOISTS, LIFTING DEVICES, AND RIGGING**

SIGNATURES

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Dennis McLain, Office of Institutional Coordination (F-9)	Date
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**CRITERION 601
CRANES, HOISTS, LIFTING DEVICES, AND RIGGING**

1.0 PURPOSE

Cranes, hoists, lifting devices, and rigging are important elements of any operation that handles heavy, or awkward items. They allow one person, or a few workers to move what once required an army. The forces controlled by this equipment are so great that malfunction could cause instantaneous death and/or extreme property damage. Malfunctions of all equipment must be minimized; but, preventing the sudden, uncontrolled and unexpected release of energy from cranes, hoists, lifting devices, and rigging is imperative. This criterion will assist unit owners and users develop a systematic, inspection, maintenance, repair, and test program for each unit.

2.0 SCOPE

This criterion addresses practices that are accepted by equipment manufacturers and standards agencies to help assure the operational fitness of cranes, hoists, lifting devices, and rigging. Requirements for crane, hoist, lifting device, and rigging operator training and safety are the responsibility of the Laboratory's safety organization (refer to LANL, AR 13.2, Cranes, Hoists, Lifting Devices, and Rigging for these requirements).

3.0 DEFINITIONS**3.1 Abnormal Function**

Any anomalous behavior detected during operation, inspection, testing, or maintenance.

3.2 Capacity

The maximum hook load that a piece of hoisting equipment is designed to carry (also known as rated capacity).

3.3 Corrective Maintenance

The repair of defective, failed, or malfunctioning units, or equipment to restore the intended function, or design condition. This form of maintenance may not result in a significant extension of the expected useful life.

3.4 Designated Person

A representative of the owner having oversight responsibility for specified cranes, hoists, lifting devices, and rigging. The designated person shall be knowledgeable of the standards, regulations, rules, maintenance, and safety requirements for each unit.

3.5 Formally Removed From Active Service

Units locked and tagged out of service and de-energized, or locked away, tagged not to be used, and removed from the active service list.

3.6 Frequent Use

The continuous, daily, or weekly use of a unit within its design parameters.

3.7 Maintenance Cycle

The scheduled frequency upon which a unit is maintained.

3.8 Owner

The Facility Manager or Line Manager who is responsible for the unit.

3.9 Periodic Inspections

Inspections conducted not more frequently than every thirty days.

3.10 Potentially Hazardous Condition

Any activity that could potentially cause harm, or damage to personnel, or property.

3.11 Preventative Maintenance

All systematically planned and scheduled actions performed for the purpose of preventing failure.

3.12 Sensitive Material

Items whose consequences of damage or destruction could lead to severe ramifications far beyond the damage, or loss of the specific item itself.

3.13 Temporary Fix

Repairs, or adjustments to cranes, hoists, lifting devices, or rigging using components, parts techniques, or materials that will not return the unit to the manufacturer's specified original level of operation.

3.14 Unit

In the context of this criterion a unit refers to a crane, hoist, lifting device, or rigging component.

4.0 RESPONSIBILITIES**4.1 Facility Manager**

- Responsible for implementing a maintenance program in accordance with the requirements of this document.

- Responsible for facility systems and equipment addressed by this document and those programmatic systems and equipment which may be assigned to the FM in accordance with FMU specific Facility/Tenant Agreements.

4.2 Group Leader

- Responsible for implementing a maintenance program in accordance with the requirements of this document.
- Responsible for those programmatic systems and equipment addressed by this document for which they have responsibility.

4.3 F-9 Facilities Engineering Services

F-9 is responsible for the technical content of this Criterion and assessing the proper implementation across the Laboratory. F-9 also provides technical assistance and support in the implementation of the listed requirements and guidance.

5.0 PRECAUTIONS AND LIMITATIONS

- 5.1** Nuclear facilities and certain high hazard facilities (e.g. high explosive operations) may have additional facility specific requirements beyond those presented in this Criterion which are contained in the Safety Analysis Report (SAR), Technical Safety Requirements (TSR), or facility safety plans, as applicable.

6.0 REQUIREMENTS

6.1 Unit Operation, Inspection, Maintenance, and Test

Operate, inspect, maintain, and test all units in compliance with manufacturer's recommendations, the ANSI B30 series (for cranes, hoists lifting devices and rigging), OSHA 1910.179, Overhead and Gantry Cranes, LANL AR-13.2, Cranes, Hoists, Lifting Devices, and Rigging, ASME/PALD-12 Shop Cranes. If nothing else is available, the designated person with assistance from F-9 will stipulate requirements for a specific unit not addressed through the ANSI B30 series or the ASME/PALD-12.

6.2 Corrective Maintenance

Repair units as soon as practical.

- 6.2.1** Abnormal functioning, or equipment defects discovered during operation, inspection, maintenance or testing shall be reported to the unit's owner through the designated person.

- 6.2.2** All potentially hazardous conditions disclosed through general

observation, maintenance, inspection or testing shall be corrected before use of the affected unit can resume.

6.2.3 All maintenance shall be performed to reinstate the unit to its original level of operation. Temporary fixes cannot be made to allow a unit's use at its rated capacity. Based on engineering evaluation, units may be used at a reduced capacity, for a limited period of time, until permanent repairs can be completed.

6.3 Use and Operations

Comply with AR 13.2, Cranes, Hoists, Lifting Devices, and Rigging for the operation and use of cranes, hoists, lifting devices, and rigging

6.4 Parts and Counterfeit Parts

Assure that replacement parts are at least equal to manufacturer's original parts and that no counterfeit parts are used on units. Contact ESH-14 for information on counterfeit parts.

6.5 Prohibited Usage and Maintenance Practices

The use of a unit outside of, or beyond its design parameters is prohibited (example: side loading). All maintenance shall be performed to reinstate the unit to its original level of operation. No temporary fixes are allowed except as indicated in Section 6.2.3 above.

6.6 Units Not In Service

6.6.1 Removal From Active Service

Unused units may be locked and tagged out of service and de-energized; or locked away, tagged not to be used, and removed from the active service list.

6.6.2 Reactivation

Units formally removed from active service (as indicated above in 6.6.1) are not required to receive inspections, maintenance, or testing until there is a need to use them. Such units are required to receive inspection, maintenance, and possibly testing, as identified below, before they can be used again, or returned to active service.

proposed use will be within thirty days of last monthly inspection:

- conduct a pre-operational inspection
- perform maintenance as dictated by the pre-operational inspection findings

proposed use will be within twelve months of last annual inspection:

- conduct a monthly inspection
- perform maintenance as dictated by the inspection findings

proposed use will be beyond twelve months of last annual inspection:

- conduct an annual inspection
- perform maintenance as dictated by inspection findings

6.7 Referenced Regulations

The regulations that govern operations, inspection, repairs, and maintenance are different depending on each unit's type, or configuration. This criterion, therefore, cannot include their contents. The designated person must become familiar with the provisions of the referenced regulations that apply to each specific unit under his/her jurisdiction and develop applicable programs.

6.8 Designated Person

Each crane, hoist, lifting device, and piece of rigging shall be assigned to a designated person who, as a representative of the unit's owner shall:

- coordinate maintenance
- coordinate periodic inspections
- coordinate tests
- receive notifications of abnormal unit operation
- evaluate the immediacy of and arrange for all corrective maintenance
- report policy violations, equipment misuse/abuse, and accidents to supervision and the unit's owner.
- assure unit's continued code compliance
- identify pre-existing code violations and establish a schedule for their correction.

6.9 Code precautions-(for Annual Inspection & Maintenance Personnel)

Before maintenance, adjustments, or repairs are started, comply with the "Maintenance Precautions" subsection within the applicable ANSI B30 series standard for the unit about to be maintained. If there is not an ANSI B30 series standard applicable to the specific unit, and there are no obtainable manufacturer's maintenance precautions, develop and comply with maintenance precautions modeled after those found in ANSI B30.11 (Monorail and Underhung Cranes).

6.10 Annual Inspection & Maintenance Personnel Qualifications

Crane, hoist, lifting device, and rigging maintenance shall be performed only by individuals completing a minimum of 80 classroom hours (offered by a nationally recognized crane service, or crane safety training authority).

6.11 Preventative Maintenance

Perform preventative maintenance at least annually for each unit in service. Frequently used units, units handling sensitive materials, or units used routinely near their capacity are candidates for preventative maintenance more frequent than annual maintenance.

7.0 RECOMMENDED GOOD PRACTICES

7.1 Facility Management Personnel, Operators, inspectors, and maintenance personnel should familiarize themselves with the DOE Hoisting and rigging manual.

7.2 Maintenance personnel should have minimum of 3 years experience maintaining the types of units that they are responsible for servicing.

8.0 DOCUMENTATION**8.1 General Records**

Maintain auditable records of all maintenance, repairs, tests and inspections.

8.2 Inspection and Maintenance Record Pouches

Provide each stationary crane and hoist with a weatherproof pouch containing its inspection and maintenance record. Include on each record the inspector's or service person's name, type of inspection, or maintenance conducted.

9.0 REFERENCES**9.1 ANSI/ASME B30 Series**

B30.1	Jacks
B30.2.0	Overhead and Gantry Cranes (Top Running Bridge, Multiple Girder)
B30.3	Hammerhead Tower Cranes
B30.4	Portal, Tower, and Pillar cranes
B30.5	Crawler, Locomotive, and Truck Cranes
B30.6	Derricks
B30.7	Base Mounted Drum Hoists

B30.8	Floating Cranes and Floating Derricks
B30.9	Slings
B30.10	Hooks
B30.11	Monorails and Underhung Cranes
B30.12	Handling Loads Suspended from Rotor Craft
B30.13	Controlled Mechanical Storage Cranes
B30.14	Side Boom Tractors
B30.16	Overhead Hoists (Underhung)
B30.17	Overhead and Gantry Cranes (Top Running Bridge, Single Girder, Underhung Hoist)
B30.18	Overhead Stacker Cranes (Top Running Bridge, Multiple Girder)
B30.19	Cableways
B30.20	Below the Hook Lifting Devices
B30.21	Manually Lever Operated Hoists
B30.22	Articulating Boom Cranes

9.2 ASME/PALD-12 Shop Cranes

9.3 DOE Hoisting and Rigging manual

9.4 LANL AR 13.2, Cranes, Hoists, Lifting Devices, and Rigging

9.5 OSHA 1910.179 Overhead and Gantry Cranes

10.0 APPENDICES

Not applicable